

FINAL REPORT

Microbiological Sampling Report

for

National Oceanic & Atmospheric Administration

Sampling Conducted on the Twelfth Floor

of Building SSMC-4

on February 7, 2000

Interagency Agreement #: D8H00CO31200

Task: 9903

January 9, 2001

Prepared by

US Public Health Service

Executive Summary

At the request of the National Oceanic & Atmospheric Administration (NOAA), Federal Occupational Health (FOH) conducted a microbiological sampling in rooms 12122, 12128, 12129, 12134, 12135, 12250, and 12251 of Building SSMC-4, located at 1305 East-West Highway, Silver Spring, Maryland. Sampling was conducted on February 7, 2000. Air (both Andersen[®] and Zefon[®]), swab, contact plate, and vacuum dust samples were collected from these rooms and an indoor reference room 12236. Air samples were also collected from outdoors.

Findings from this sampling are as follows:

- Due to winter season, airborne fungal levels were low. Indoor airborne fungal levels, by Andersen sampling, were lower than those of outdoors. *Stachybotrys chartarum* was not detected from air samples.
- Very low fungal burden was detected from wipe samples collected from surfaces of supply diffusers and return troughers in light fixture.
- In general, fungal burden on vertical surfaces was lower than that of horizontal surfaces.
- Elevated fungal levels were detected from some samples collected from horizontal surfaces in rooms 12122 and 12128.
- *Stachybotrys chartarum* was detected from contact plate sample collected on a horizontal surface in room 12134.
- Fungal levels in four plenum dust samples collected were at 10^4 - 10^5 CFU/g of fine dust levels. *Stachybotrys chartarum* was detected from every plenum dust sample analyzed.
- Fungal levels in carpet and furniture dust of these rooms were at 10^3 - 10^4 CFU/g levels. *Stachybotrys chartarum* was detected from most of furniture dust samples and some carpet dust samples.

INTRODUCTION

At the request of the National Oceanic & Atmospheric Administration (NOAA), Federal Occupational Health (FOH) conducted a microbiological sampling in rooms 12122, 12128, 12129, 12134, 12135, 12250, and 12251 of Building SSMC-4, located at 1305 East-West Highway, Silver Spring, Maryland. Sampling was conducted on February 7, 2000. Air (both Andersen[®] and Zefon[®]), swab, contact plate, and vacuum dust samples were collected from these rooms and an indoor reference room 12236. Air samples were also collected from outdoors.

EVALUATION METHODOLOGY

Air Samples

Various types of samples were collected from these rooms on February 7, 2000. Two types of air samples were collected from each room: (1) culturable method using Andersen[®] N-6 samplers at a flow rate of 28.3 L/min, and (2) non-culturable method using Zefon[®] Air-O-Cell cassettes at a flow rate of 15 L/min. Indoor Andersen[®] air samples were collected for 3 minutes and outdoor samples were collected for both one and three minutes. Two percent (2 %) malt extract agar (MEA) and cellulose Czapek agar (CCA) was used to recover general fungi and cellulose-loving fungi, respectively. Non-culturable air samples were collected at the aforementioned sampling locations. Indoor samples were collected from ten minutes and outdoor samples were collected for both five and ten minutes. Outdoor air samples were collected near the entrance of the building. Temperature and relative humidity measurements were collected from each air sampling location by a battery operated, direct readout Hygroskop[®] meter.

Contact Plate Samples

To determine fungal burden on horizontal and vertical surfaces of these rooms, five to eight contact plate samples were collected from each room. Samples were collected from randomly selected horizontal and vertical surfaces. Sampling was conducted by pressing the MEA-filled Rodac[®] plate against the surface of interest for five seconds. A total of 47 contact plate samples were collected.

Swab Samples

Swab samples were collected from surfaces of each supply diffusers and return troughers in each room. They were collected by wiping a known area of surface with a sterile cotton swab (Culturette[®]) wetted with holding media. Approximately 5 in² area was wiped for return trougher and 4 in² for supply diffusers. The swab was then placed directly into its holder. Each holder was labeled with an identifiable number. A total of 21 wipe samples were collected from these rooms.

Vacuum Dust Samples

Dust accumulated on carpeting, chairs and fabric system furniture, and the plenum were collected with a High Efficiency Particulate Air (HEPA) vacuum attached with a special “sock” device. For each carpet sample, a 3-ft by 3-ft area was vacuumed for at least five minutes. Total surface areas of 9 ft² were vacuumed from system furniture and chairs, and composite as one sample. Dust accumulated above the ceiling plenum was also vacuumed and composite as one sample. One carpet sample, one composite furniture sample, and one composite plenum sample were collected from each room, when applicable.

All samples collected were sent for next morning delivery to FOH’s Environmental Microbiology Laboratory (EML) in Philadelphia, Pennsylvania for analysis.

Laboratory Procedures

Upon receipt, all Andersen[®] air and contact plate samples were incubated in a 25°C incubator. Each swab sample was

suspended in sterile distilled water, diluted serially, and inoculated onto agar plates. Both MEA and CCA were used for retrieving fungi. At least three dilution series were used for each sample. Each vacuum dust sample was sieved through a 250 mm sieve. The fine dust (< 250 mm) retrieved was then weighed and followed the dilution plating for fungal analysis.

All plates were incubated in a 25°C incubator. They were examined every other day for up to 10 days to ensure the full recovery of fungi. Fungal identification was based on colony morphology, spores and conidia formation. Total fungal colonies formed on each MEA plate and *Stachybotrys chartarum* on CCA plates were counted and recorded. Fungal levels in samples were presented as colony forming units (CFUs) per measuring unit. For example, CFU/m³ for Andersen[®] air samples, CFU/in² for wipe samples, CFU/plate for contact plate samples, and CFU/g of fine dust for vacuum dust samples.

All Zefon[®] cassette samples were analyzed by the Environmental Microbiology Laboratory in Escondido, California for direct microscopic examination. Fungal spores were identified and their airborne levels were presented as spores/m³.

RESULTS AND DISCUSSION

Temperature and Relative Humidity

Indoor temperature and relative humidity measurements ranged from 71.9°F to 73.0°F, and 17.9% – 18.8%, respectively (Table 1). Outdoors temperature reading was lower, but with a higher relative humidity (Table 1).

Microbiological Analyses Results

All laboratory analytical reports from FOH's EML are presented in Attachment A in a laboratory report #NOAA-00-26R. Results from microscopic examination of Zefon[®] cassette samples are presented in Attachment B.

Air Samples

Andersen Results

Due to winter season, airborne fungal levels were low. Most of samples showed no fungal growth. Outdoor airborne fungal levels were 118 CFU/m³ and 71 CFU/m³ (Table 1). Fungi detected outdoors were *Mucor*, *Cladosporium*, *Alternaria*, *Penicillium*, Ascomycetes, and Basidiomycetes. *Stachybotrys chartarum* was not detected from these samples.

Zefon Results

Very low fungal spore levels were detected from indoors. Spore levels ranged from below the detection limit of 7 spores/m³ to 61 spores/m³ (Table 1). Outdoor spore levels were 47 spores/m³ and 160 spores/m³ (Table 1). Fungal spore types recovered from outdoors were *Cladosporium*, *Penicillium/Aspergillus*, and others such as Smuts, Periconia, Myxomycetes. *Stachybotrys chartarum* was not detected from any sample collected.

Wipe Samples

Most (17 out of 21) samples collected from surfaces of supply diffusers and return troughers in light fixtures were below the detection limits (BDL) (10 CFU/in² for supply diffuser and 8 CFU/in² for return trougher). Samples showing fungal growth were collected from rooms 12128, 12134, 12250, and 12251 with fungal levels ranged from 8 CFU/in² to 20 CFU/in². *Stachybotrys chartarum* was not detected from these samples.

Contact Plate Samples

In general, higher fungal levels were detected from the horizontal surfaces than vertical surfaces (Table 2). Fungal levels on vertical surfaces ranged from BDL of 1 CFU/plate to 5 CFU/plate (Table 2). Fungal levels on horizontal surfaces ranged from BDL of 1 CFU/plate to 113 CFU/plate. *Penicillium* was the predominant fungal genus recovered, followed by *Cladosporium*. *Stachybotrys chartarum* was detected from one sample collected from the top of the lateral file in room 12134 (sample # 4-12134-0207CP6).

Higher fungal levels (5 CFU/plate – 113 CFU/plate) were detected from surfaces of room 12122 (samples # 4-12122-0207CP4 – CP8), with *Cladosporium* as the predominant fungi recovered. Elevated fungal level was also detected from a corner desk surface in room 12128 (sample # 4-12128-0207CP5). *Penicillium* was the predominant fungal genus recovered from this sample.

Vacuum Dust Samples

Diverse fungal genera, such as *Alternaria*, *Aspergillus flavus*, *Aspergillus niger*, other *Aspergillus* species, *Aureobasidium*, *Bipolaris*, *Chaetomium*, *Cladosporium*, *Epicoecum*, *Mucor*, *Nigrospora*, *Paecilomyces*, *Penicillium*, *Pithomyces*, *Rhizopus*, *Trichoderma*, Ascomycetes, Basidiomycetes, and yeast were recovered from these dust samples.

Plenum Dust

Plenum dust was collected from rooms 12122, 12135, 12250, and a control area 12236. Fungal levels in the fine dust collected from the plenum were at 10^4 - 10^5 CFU/g of fine dust levels (Table 3). The fungal level in room 12122 and 12122 were higher than that of control area. *Penicillium* dominated these samples followed by *Cladosporium*, *Aspergillus niger*, and *Alternaria*. *Stachybotrys chartarum* was detected from every sample collected (Table 3).

Carpet Dust

Fungal levels in the fine dust in carpet of these rooms were at the levels of 10^3 – 10^4 CFU/g of fine dust (Table 3). Predominant fungi detected were *Cladosporium*, and *Penicillium* followed by *Alternaria* and *Aspergillus*. It is important to note that *Aspergillus niger* dominated the carpet dust sample collected from room 12128. *Stachybotrys chartarum* was detected from carpet dust samples collected from room 12122 and a control area 12236.

Furniture Dust

Due to insufficient dust sample collected from control room 12236, no analysis was performed on this sample. Except for room 12134, *Stachybotrys chartarum* was detected from every sample collected. Fungal levels in the fine dust of furniture in these rooms were at the levels of 10^3 – 10^4 CFU/g of fine dust (Table 3). *Aureobasidium*, *Alternaria*, *Cladosporium*, *Penicillium*, and *Paecilomyces* were recovered from these samples.

CONCLUSIONS

• Due to winter season, airborne fungal levels were low. Indoor airborne fungal levels, by Andersen sampling, were lower than those of outdoors. *Stachybotrys chartarum* was not detected from air samples.

- Very low fungal burden was detected from wipe samples collected from surfaces of supply diffusers and return troughers in light fixture.
- In general, fungal burden on vertical surfaces was lower than that of horizontal surfaces.
- Elevated fungal levels were detected from some samples collected from horizontal surfaces in rooms 12122 and 12128.
- *Stachybotrys chartarum* was detected from contact plate sample collected on a horizontal surface in room 12134.
- Fungal levels in four plenum dust samples collected were at 10^4 - 10^5 CFU/g of fine dust levels. *Stachybotrys chartarum* was detected from every plenum dust sample analyzed.
- Fungal levels in carpet and furniture dust of these rooms were at 10^3 - 10^4 CFU/g levels. *Stachybotrys chartarum* was detected from most of furniture dust samples and some carpet dust samples.

RECOMMENDATIONS

- Conduct thorough HEPA vacuuming and wet wiping of horizontal surfaces in rooms 12122, 12128, and 12134.
- Conduct thorough HEPA vacuuming of carpeting in rooms 12128, 12250, and 12251; and porous system furniture in rooms 12128, 12129, and 12251.
- Conduct any above ceiling plenum work after hour. Thoroughly HEPA vacuum the surrounding areas afterwards.
- Implement an emergency water intrusion protocol for this building to adequately manage any unexpected water intrusion in order to prevent fungal proliferation.

ATTACHMENT A

**Microbiological laboratory reports for samples collected
from twelfth floor of SSMC-4, on February 7, 2000.**

USPHS DFOH ENVIRONMENTAL MICROBIOLOGY LABORATORY, PHILADELPHIA, PA

LABORATORY REPORT #NOAA-00-26R-A

Client agency: National Oceanic and Atmospheric Administration, Silver Spring, MD

POIS#/task #: D8H00CO31200 / 9903

Sampling date: 2/7/00

Dates of inoculation: 2/7/00

General location: SSMC-4, Silver Spring, MD

Specific location: 12th floor

Sampling techniques: Air (Andersen N-6 sampler) and contact plate samplings

Medium used: Malt extract agar (MEA) and cellulose Czapek agar (CCA) for fungi

Samples submitted by: J. Sobelman

Date characterization completed: 2/18/00

(A) Air samples on MEA and CCA plates

Sample ID	Sampling Location	Air Volume (L)	Fungi on MEA @ 25° C	Presence of <i>Stachybotrys chartarum</i>*** on CCA @ 25° C
Blank	Field blank	NA#	No fungal growth	No
OA271, 2	Outside bldg. 4	84.9	1. <i>Mucor</i> (4*) 2. <i>Cladosporium</i> (3) 3. <i>Alternaria</i> (1) 4. <i>Penicillium</i> (1) 5. Ascomycetes (1) CFU/m ³ = 118	No
OA273, 4	Outside bldg. 4	28.3	1. <i>Mucor</i> (1) 2. Basidiomycetes (1) CFU/m ³ = 71	No
4-12236-0207A1, A2	12 th floor, room 12236, center of cube	84.9	No fungal growth CFU/m ³ < 12	No
4-12122-0207A1, A2	12 th floor, room 12122, center of office	84.9	No fungal growth CFU/m ³ < 12	No

Sample ID	Sampling Location	Air Volume (L)	Fungi on MEA @ 25° C	Presence of <i>Stachybotrys chartarum</i>*** on CCA @ 25° C
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4-12250-0207A1, A2	12 th floor, room 12250, center of cube	84.9	No fungal growth CFU/m ³ < 12	No
4-12251-0207A1, A2	12 th floor, room 12251, center of cube	84.9	No fungal growth CFU/m ³ < 12	No
4-12134-0207A1, A2	12 th floor, room 12134, center of cube	84.9	No fungal growth CFU/m ³ < 12	No
4-12129-0207A1, A2	12 th floor, room 12129, center of cube	84.9	No fungal growth CFU/m ³ < 12	No
4-12128-0207A1, A2	12 th floor, room 12128	84.9	No fungal growth CFU/m ³ < 12	No
SB	Shipping blank	NA [#]	No fungal growth	No

(B) Contact plate samples on MEA plates

Sample ID	Sampling Location	Fungi detected on MEA @ 25° C
4-12236-0207CP1	12 th floor, room 12236, front lateral file	1. <i>Paecilomyces</i> (4) 2. <i>Cladosporium</i> (1) CFU/plate = 5
4-12236-0207CP2	12 th floor, room 12236, front file	1. <i>Cladosporium</i> (1) CFU/plate = 1
4-12236-0207CP3	12 th floor, room 12236, top of computer	1. <i>Penicillium</i> (3) 2. <i>Aspergillus sp.</i> (2) 3. <i>Mucor</i> (1) CFU/plate = 6

Sample ID	Sampling Location	Fungi detected on MEA @ 25° C

4-12236-0207CP4	12 th floor, room 12236, top of desk	1. <i>Cladosporium</i> (4) 2. <i>Penicillium</i> (4) 3. <i>Alternaria</i> (1) CFU/plate = 9
4-12236-0207CP5	12 th floor, room 12236, top of system furniture	1. <i>Aspergillus sp.</i> (1) CFU/plate = 1
4-12122-0207CP1	12 th floor, room 12122, wall near window, west	1. <i>Penicillium</i> (1) CFU/plate = 1
4-12122-0207CP2	12 th floor, room 12122, wall near door, east	No fungal growth CFU/plate < 1
4-12122-0207CP3	12 th floor, room 12122, wall near window, south	No fungal growth CFU/plate < 1
4-12122-0207CP4	12 th floor, room 12122, wall adjacent to door, north	1. <i>Aureobasidium</i> (1) 2. <i>Cladosporium</i> (1) CFU/plate = 2
4-12122-0207CP5	12 th floor, room 12122, window sill, south	1. <i>Cladosporium</i> (12) 2. <i>Penicillium</i> (2) 3. <i>Aspergillus versicolor</i> *** (1) CFU/plate = 15
4-12122-0207CP6	12 th floor, room 12122, window sill, west	1. <i>Cladosporium</i> (87) 2. <i>Alternaria</i> (18) 3. <i>Penicillium</i> (5) 4. <i>Epicoccum</i> (2) 5. <i>Nigrospora</i> (1) CFU/plate = 113
4-12122-0207CP7	12 th floor, room 12122, top of TV	1. <i>Cladosporium</i> (5) CFU/plate = 5

Sample ID	Sampling Location	Fungi detected on MEA @ 25° C

4-12122-0207CP8	12 th floor, room 12122, top of desk	1. <i>Cladosporium</i> (16) 2. <i>Penicillium</i> (5) 3. <i>Aspergillus fumigatus</i> ** (1) 4. <i>Aspergillus sp.</i> (1) 5. <i>Aureobasidium</i> (1) CFU/plate = 24
4-12250-0207CP1	12 th floor, room 12250, front lateral file	No fungal growth CFU/plate < 1
4-12250-0207CP2	12 th floor, room 12250, wall near window	1. <i>Alternaria</i> (1) CFU/plate = 1
4-12250-0207CP3	12 th floor, room 12250, column above system furniture	No fungal growth CFU/plate < 1
4-12250-0207CP4	12 th floor, room 12250, top of desk	1. yeast (1) CFU/plate = 1
4-12250-0207CP5	12 th floor, room 12250, top of system furniture	No fungal growth CFU/plate < 1
4-12250-0207CP6	12 th floor, room 12250, top of lateral file	1. <i>Penicillium</i> (2) 2. <i>Aureobasidium</i> (1) 3. <i>Cladosporium</i> (1) CFU/plate = 4
4-12251-0207CP1	12 th floor, room 12251, front of file cabinet	1. <i>Alternaria</i> (1) 2. <i>Penicillium</i> (1) CFU/plate = 2
4-12251-0207CP2	12 th floor, room 12251, front of file cabinet	No fungal growth CFU/plate < 1
4-12251-0207CP3	12 th floor, room 12251, top of computer	1. <i>Penicillium</i> (5) 2. <i>Cladosporium</i> (1) CFU/plate = 6

Sample ID	Sampling Location	Fungi detected on MEA @ 25° C

4-12251-0207CP4	12 th floor, room 12251, top of desk	1. <i>Penicillium</i> (4) 2. <i>Epicoccum</i> (1) 3. <i>Nigrospora</i> (1) CFU/plate = 6
4-12251-0207CP5	12 th floor, room 12251, top of system furniture	1. <i>Paecilomyces</i> (9) 2. <i>Penicillium</i> (1) CFU/plate = 10
4-12135-0207CP1	12 th floor, room 12135, box on shelf, right side	1. <i>Cladosporium</i> (1) 2. <i>Penicillium</i> (1) 3. yeast (2) CFU/plate = 4
4-12135-0207CP2	12 th floor, room 12135, front of books, left side	No fungal growth CFU/plate < 1
4-12135-0207CP3	12 th floor, room 12135, side of shelf facing entrance	No fungal growth CFU/plate < 1
4-12135-0207CP4	12 th floor, room 12135, top of shelf, right side	1. <i>Aureobasidium</i> (2) 2. <i>Penicillium</i> (2) 3. Basidiomycetes (1) CFU/plate = 5
4-12135-0207CP5	12 th floor, room 12135, top of shelf, left side	1. <i>Penicillium</i> (9) 2. <i>Cladosporium</i> (1) CFU/plate = 10
4-12134-0207CP1	12 th floor, room 12134, wall near window	1. <i>Aureobasidium</i> (1) 2. <i>Cladosporium</i> (1) CFU/plate = 2
4-12134-0207CP2	12 th floor, room 12134, wall adjacent window	1. <i>Aureobasidium</i> (2) CFU/plate = 2

Sample ID	Sampling Location	Fungi detected on MEA @ 25° C

4-12134-0207CP3	12 th floor, room 12134, column opposite window	No fungal growth CFU/plate < 1
4-12134-0207CP4	12 th floor, room 12134, end of system shelf	No fungal growth CFU/plate < 1
4-12134-0207CP5	12 th floor, room 12134, top of computer	<ol style="list-style-type: none"> 1. <i>Aureobasidium</i> (4) 2. <i>Cladosporium</i> (4) 3. <i>Penicillium</i> (2) 4. <i>Alternaria</i> (1) CFU/plate = 11
4-12134-0207CP6	12 th floor, room 12134, top of lateral file	<ol style="list-style-type: none"> 1. <i>Paecilomyces</i> (1) 2. <i>Stachybotrys chartarum</i>*** (1) CFU/plate = 2
4-12134-0207CP7	12 th floor, room 12134, top of desk	<ol style="list-style-type: none"> 1. <i>Cladosporium</i> (4) 2. <i>Penicillium</i> (4) 3. <i>Alternaria</i> (1) 4. <i>Aspergillus sp.</i> (1) 5. Basidiomycetes (1) CFU/plate = 11
4-12134-0207CP8	12 th floor, room 12134, top of system furniture	<ol style="list-style-type: none"> 1. <i>Cladosporium</i> (1) 2. <i>Penicillium</i> (1) 3. <i>Trichoderma</i> (1) CFU/plate = 3
4-12129-0207CP1	12 th floor, room 12129, front of grey lateral file	No fungal growth CFU/plate < 1
4-12129-0207CP2	12 th floor, room 12129, front of grey file	<ol style="list-style-type: none"> 1. <i>Penicillium</i> (1) CFU/plate = 1
4-12129-0207CP3	12 th floor, room 12129, top of computer	<ol style="list-style-type: none"> 1. <i>Penicillium</i> (1) 2. <i>Trichoderma</i> (1) CFU/plate = 2

Sample ID	Sampling Location	Fungi detected on MEA @ 25° C
4-12129-0207CP4	12 th floor, room 12129, top of desk	<ol style="list-style-type: none"> 1. <i>Paecilomyces</i> (5) 2. <i>Penicillium</i> (3) 3. <i>Cladosporium</i> (2) CFU/plate = 10
4-12129-0207CP5	12 th floor, room 12129, top of system furniture	<ol style="list-style-type: none"> 1. <i>Penicillium</i> (6) 2. <i>Cladosporium</i> (3) 3. <i>Aspergillus sp.</i> (1) 4. Basidiomycetes (1) CFU/plate = 11
4-12128-0207CP1	12 th floor, room 12128, wall near window	No fungal growth CFU/plate < 1
4-12128-0207CP2	12 th floor, room 12128, front of lateral file	No fungal growth CFU/plate < 1
4-12128-0207CP3	12 th floor, room 12128, top of table with plants	<ol style="list-style-type: none"> 1. <i>Aspergillus sp.</i> (4) 2. <i>Cladosporium</i> (3) 3. <i>Alternaria</i> (1) 4. <i>Epicoccum</i> (1) 5. <i>Mucor</i> (1) CFU/plate = 10
4-12128-0207CP4	12 th floor, room 12128, shelf over desk	<ol style="list-style-type: none"> 1. <i>Cladosporium</i> (5) 2. <i>Penicillium</i> (5) 3. <i>Alternaria</i> (1) 4. <i>Aspergillus sp.</i> (1) 5. <i>Paecilomyces</i> (1) CFU/plate = 13

Sample ID	Sampling Location	Fungi detected on MEA @ 25° C

4-12128-0207CP5	12 th floor, room 12128, corner of desk	1. <i>Penicillium</i> (13) 2. <i>Aspergillus sp.</i> (8) 3. <i>Cladosporium</i> (8) 4. <i>Alternaria</i> (1) 5. <i>Aspergillus fumigatus</i> ** (1) 6. <i>Aureobasidium</i> (1) CFU/plate = 32
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* Colony counts.

** Opportunistic fungi.

*** Toxigenic fungi.

Not applicable.

ATTACHMENT B

USPHS DFOH ENVIRONMENTAL MICROBIOLOGY LABORATORY, PHILADELPHIA, PA LABORATORY REPORT #NOAA-00-26R-B

Client agency: National Oceanic and Atmospheric Administration, Silver Spring, MD

POIS#/task #: D8H00CO31200 / 9903

Sampling date: 2/7/00

Date of inoculation: 2/8/00

General location: SSMC-4, Silver Spring, MD

Specific location: 12th floor

Sampling technique: Wipe samplings

Medium used: Malt extract agar (MEA) and cellulose Czapek agar (CCA) for fungi

Samples submitted by: J. Sobelman

Date characterization completed: 2/18/00

Wipe samples on MEA and CCA plates

FOH ID	Sample ID	Sampling Location	Area (in ²)	Dilution factor	Fungi on MEA @ 25°C	Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C
W01	4-12236-0207R1	12 th floor, room 12236, return	5	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 8	No
W02	4-12236-0207R2	12 th floor, room 12236, return	5	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 8	No
W03	4-12122-0207S1	12 th floor, room 12122, supply	4	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 10	No
W04	4-12122-0207S2	12 th floor, room 12122, supply	4	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 10	No
W05	4-12122-0207S3	12 th floor, room 12122, supply	4	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 10	No
W06	4-12122-0207S4	12 th floor, room 12122, supply	4	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 10	No
W07	4-12122-0207R1	12 th floor, room 12122, return	5	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 8	No

FOH ID	Sample ID	Sampling Location	Area (in ²)	Dilution factor	Fungi on MEA @ 25°C	Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C
W08	4-12122-0207R2	12 th floor, room 12122, return	5	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 8	No
W09	4-12250-0207S1	12 th floor, room 12250, supply	4	40X-MEA 10X-CCA	1. yeast (1*) CFU/in ² = 10	No
W10	4-12250-0207R1	12 th floor, room 12250, return	5	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 8	No
W11	4-12251-0207R1	12 th floor, room 12251, return	5	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 8	No
W12	4-12251-0207R2	12 th floor, room 12251, return	5	40X-MEA 10X-CCA	1. yeast (1) CFU/in ² = 8	No
W13	4-12134-0207S1	12 th floor, room 12134, supply	4	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 10	No

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W14	4-12134-0207S2	12 th floor, room 12134, supply	4	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 10	No
W15	4-12134-0207R1	12 th floor, room 12134, return	5	40X-MEA 10X-CCA	1. <i>Aureobasidium</i> (1) CFU/in ² = 8	No
W16	4-12134-0207R2	12 th floor, room 12134, return	5	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 8	No
W17	4-12129-0207R2	12 th floor, room 12129, return	5	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 8	No
W18	4-12129-0207S1	12 th floor, room 12129, supply	4	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 10	No
W19	4-12128-0207S1	12 th floor, room 12128, supply	4	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 10	No
W20	4-12128-0207S2	12 th floor, room 12128, supply	4	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 10	No

FOH ID	Sample ID	Sampling Location	Area (in ²)	Dilution factor	Fungi on MEA @ 25°C	Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C
W21	4-12128-0207R1	12 th floor, room 12128, return	2	40X-MEA 10X-CCA	1. <i>Penicillium</i> (1) CFU/in ² = 20	No

* Colony counts.

*** Toxigenic fungi.

ATTACHMENT C

USPHS DFOH ENVIRONMENTAL MICROBIOLOGY LABORATORY, PHILADELPHIA, PA

LABORATORY REPORT #NOAA-00-26R-C

Client agency: National Oceanic and Atmospheric Administration, Silver Spring, MD

POIS#/task #: D8H00CO31200 / 9903

Sampling date: 2/7/00

Dates of inoculation: 2/11/00 and 2/12/00

General location: SSMC-4, Silver Spring, MD

Specific location: 12th floor

Sampling technique: Vacuum dust sampling

Medium used: Malt extract agar (MEA) and Cellulose Czapek agar (CCA) for fungi

Samples submitted by: J. Sobelman

Date characterization completed: 2/22/00

Dust samples on MEA and CCA plates

FOH ID	Sample ID	Sampling Location	Weight (g)	Dilution factor	Fungi on MEA @ 25°C	Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C
V01	4-12236-0207V01	12 th floor, room 12236, furniture	0.001##	NA@	NA	NA
V02	4-12236-0207V02	12 th floor, room 12236, carpet	0.102	40X-MEA 10X-CCA	1. <i>Cladosporium</i> (9*) 2. <i>Mucor</i> (2) 3. <i>Penicillium</i> (1) 4. <i>Rhizopus</i> (1) CFU/g = 5,098	Yes (17) CFU/g = 1,667
V03	4-12122-0207V01	12 th floor, room 12122, furniture	0.100#	40X-MEA 10X-CCA	1. <i>Alternaria</i> (10) 2. <i>Cladosporium</i> (4) 3. <i>Penicillium</i> (4) 4. <i>Aureobasidium</i> (2) 5. Basidiomycetes (1) CFU/g = 4,200	Yes (3) CFU/g = 150

FOH ID	Sample ID	Sampling Location	Weight (g)	Dilution factor	Fungi on MEA @ 25°C	Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C

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V04	4-12122-0207V02	12 th floor, room 12122, carpet	0.100	40X-MEA 40X-CCA	1. <i>Aspergillus sp.</i> (1) 2. <i>Cladosporium</i> (1) 3. <i>Penicillium</i> (1) 4. <i>Rhizopus</i> (1) CFU/g = 1,600	Yes (3) CFU/g = 1,200
V05	4-12250-0207V01	12 th floor, room 12250, furniture	0.102 [#]	40X-MEA 10X-CCA	1. <i>Alternaria</i> (8) 2. <i>Aureobasidium</i> (5) 3. <i>Aspergillus niger</i> ** (3) 4. <i>Cladosporium</i> (2) 5. <i>Paecilomyces</i> (1) 6. Ascomycetes (1) CFU/g = 3,922	Yes (2) CFU/g = 98
V06	4-12250-0207V02	12 th floor, room 12250, carpet	0.100	40X-MEA 10X-CCA	1. <i>Alternaria</i> (1) 2. <i>Cladosporium</i> (1) 3. Basidiomycetes (58) CFU/g = 2.4 x 10⁴	No
V07	4-12251-0207V01	12 th floor, room 12251, furniture	0.085 [#]	400X-MEA 40X-CCA	1. <i>Cladosporium</i> (5) 2. <i>Alternaria</i> (4) 3. <i>Aureobasidium</i> (4) 4. <i>Penicillium</i> (3) 5. <i>Bipolaris</i> (1) 6. <i>Epicoccum</i> (1) 7. <i>Nigrospora</i> (1) CFU/g = 4.5 x 10⁴	Yes (5) CFU/g = 1,176
V08	4-12251-0207V02	12 th floor, room 12251, carpet	0.101	400X-MEA 10X-CCA	1. <i>Alternaria</i> (10) 2. <i>Cladosporium</i> (4) 3. <i>Epicoccum</i> (1) CFU/g = 5.9 x 10⁴	No

FOH ID	Sample ID	Sampling Location	Weight (g)	Dilution factor	Fungi on MEA @ 25°C	Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C
V09	4-12134-0207V01	12 th floor, room 12134, furniture	0.102 [#]	40X-MEA 10X-CCA	1. <i>Alternaria</i> (12) 2. <i>Cladosporium</i> (5) 3. <i>Epicoccum</i> (3) 4. <i>Aureobasidium</i> (2) 5. <i>Penicillium</i> (2) 6. <i>Aspergillus flavus</i> *** (1) 7. <i>Aspergillus niger</i> ** (1) 8. <i>Aspergillus sp.</i> (1) 9. <i>Paecilomyces</i> (1) CFU/g = 5,490	No
V10	4-12134-0207V02	12 th floor, room 12134, carpet	0.100	40X-MEA 10X-CCA	1. <i>Chaetomium</i> (8) 2. <i>Alternaria</i> (3) 3. <i>Penicillium</i> (3) 4. <i>Aspergillus sp.</i> (1) 5. <i>Cladosporium</i> (1) 6. <i>Paecilomyces</i> (1) 7. yeast (2) CFU/g = 7,600	No
V11	4-12129-0207V01	12 th floor, room 12129, furniture	0.026 [#]	40X-MEA 10X-CCA	1. <i>Alternaria</i> (16) 2. <i>Aureobasidium</i> (1) 3. <i>Cladosporium</i> (1) 4. <i>Mucor</i> (1) CFU/g = 1.5 x 10⁴	Yes (1) CFU/g = 192
V12	4-12129-0207V02	12 th floor, room 12129, carpet	0.101	40X-MEA 10X-CCA	1. <i>Cladosporium</i> (2) 2. <i>Aspergillus sp.</i> (1) 3. <i>Penicillium</i> (1) 4. yeast (1) CFU/g = 1,980	No

FOH ID	Sample ID	Sampling Location	Weight (g)	Dilution factor	Fungi on MEA @ 25°C	Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C
V13	4-12128-0207V01	12 th floor, room 12128, furniture	0.038 [#]	40X-MEA 40X-CCA	1. <i>Penicillium</i> (11) 2. <i>Alternaria</i> (6) 3. <i>Aspergillus sp.</i> (4) 4. <i>Aureobasidium</i> (2) 5. <i>Epicoccum</i> (2) 6. <i>Paecilomyces</i> (1) 7. <i>Pithomyces</i> (1) 8. yeast (5) CFU/g = 1.7 x 10⁴	Yes (2) CFU/g = 1,053
V14	4-12128-0207V02	12 th floor, room 12128, carpet	0.100	40X-MEA 10X-CCA	1. <i>Aspergillus niger</i>** (22) 2. <i>Aureobasidium</i> (1) 3. <i>Penicillium</i> (1) 4. yeast (3) CFU/g = 1.1 x 10⁴	No
V15	4-12135-0207AC1	12 th floor, room 12135, above ceiling	0.100	400X-MEA 40X-CCA	1. <i>Penicillium</i> (21) 2. <i>Cladosporium</i> (3) 3. <i>Alternaria</i> (1) 4. <i>Aspergillus niger</i> ** (1) 5. Basidiomycetes (1) CFU/g = 1.1 x 10⁵	Yes (33) CFU/g = 1.3 x 10 ⁴

FOH ID	Sample ID	Sampling Location	Weight (g)	Dilution factor	Fungi on MEA @ 25°C	Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C
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V16	4-12122-0207AC1	12 th floor, room 12122, above ceiling	0.100	400X-MEA 40X-CCA	1. <i>Penicillium</i> (18) 2. <i>Cladosporium</i> (12) 3. <i>Alternaria</i> (3) 4. <i>Paecilomyces</i> (3) 5. <i>Aspergillus niger</i> ** (1) 6. <i>Chaetomium</i> (1) 7. <i>Epicoccum</i> (1) 8. <i>Trichoderma</i> (1) 9. yeast (1) CFU/g = 1.6 x 10⁵	Yes (47) CFU/g = 1.9 x 10⁴
V17	4-12250-0207AC1	12 th floor, room 12250, above ceiling	0.102	400X-MEA 40X-CCA	1. <i>Penicillium</i> (17) 2. <i>Alternaria</i> (1) 3. <i>Aspergillus niger</i> ** (1) 4. <i>Aureobasidium</i> (1) 5. <i>Cladosporium</i> (1) CFU/g = 8.2 x 10⁴	Yes (26) CFU/g = 1.0 x 10 ⁴

FOH ID	Sample ID	Sampling Location	Weight (g)	Dilution factor	Fungi on MEA @ 25°C	Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C
V18	4-12236-0207AC1	12 th floor, room 12236, above ceiling	0.101	40X-MEA 40X-CCA	1. <i>Penicillium</i> (34) 2. <i>Aspergillus niger</i> ** (6) 3. <i>Alternaria</i> (1) 4. <i>Cladosporium</i> (1) CFU/g = 1.7 x 10⁴	Yes (10) CFU/g = 3,960

* Colony counts.

** Opportunistic fungi.

*** Toxigenic fungi.

@ Not applicable.

5ml of sterilized distilled water were added instead of 10ml.

Insufficient amounts of dust for analysis.